1. A method of forming a shell on a template, comprising:
immersing the template in a slurry, the slurry comprising
a plurality of colloidal particles; and
a sufficient quantity of salt to impart an effective charge to the colloidal particles;
applying a voltage to the template, thereby causing the charged colloidal particles to be deposited on the template to form a green shell; and
sintering the green shell to form a solidified shell having greater mechanical integrity than the green shell.

2. The method of claim 1, wherein the template comprises a conductive material.

3. The method of claim 1, wherein the template comprises a conductive coating.

4. The method of claim 3, wherein the conductive coating is a sputtered coating.

5. The method of claim 1, wherein the slurry is nonaqueous.

6. The method of claim 5, wherein the slurry has a dielectric breakdown voltage greater than about 50 VDC.

7. The method of claim 5, wherein the slurry comprises a material selected from the group consisting of butanol, methanol, ethanol, and propanol.

8. The method of claim 1, wherein the colloidal particles comprise a material selected from the group consisting of silica, glass, alumina, silicon nitride, silicon carbide, yttria, zirconia, and oxides and nitrides of aluminum and titanium.

9. The method of claim 1, wherein the colloidal particles have an average particle size of less than 75 μm.

10. The method of claim 1, wherein the colloidal particles have an average particle size of less than 40 μm.

11. The method of claim 1, wherein the colloidal particles have an average particle size of less than 10 μm.

12. The method of claim 1, wherein the colloidal particles have an average particle size of less than 1 μm.

13. The method of claim 1, wherein the colloidal particles have an average particle size of less than 100 nm.

14. The method of claim 1, wherein the colloidal particles have an average particle size of less than 10 nm.

15. The method of claim 1, wherein the salt is selected from the group consisting of sodium chloride, potassium chloride, rubidium chloride, cesium chloride, zinc chloride, and potassium carbonate.

16. The method of claim 1, wherein the salt is a metal salt.

17. The method of claim 16, wherein the metal salt is a halide or a carbonate.

18. The method of claim 1, wherein the salt is an alkyl halide.

19. The method of claim 1, wherein the salt is present in a concentration of 5% by weight or less.

20. The method of claim 1, wherein the salt is present at a concentration in the slurry that is at or below its solubility limit.

21. The method of claim 1, wherein the applied voltage is about 100 volts.

22. The method of claim 21, wherein the applied voltage produces a current of about 3-5 mA.

23. The method of claim 1, wherein the green shell has a pore fraction not greater than 40% by volume.

24. The method of claim 1, wherein the green shell has a pore fraction not greater than 30% by volume.

25. The method of claim 1, further comprising drying the green shell prior to sintering.

26. The method of claim 1, further comprising:
after immersing the template and applying a voltage, immersing the template in a second slurry comprising a second plurality of colloidal particles; and
applying a second voltage to the template to cause the second plurality of colloidal particles to be deposited on the green shell to increase its thickness.

27. A method of producing a desired article, comprising:
providing a template having a predetermined shape;
depositing an investment mold on the template, wherein depositing comprises:
immersing the template in a slurry, the slurry comprising a plurality of colloidal particles and a sufficient quantity of salt to impart an effective charge to the colloidal particles;
applying a voltage to the template, thereby causing the charged colloidal particles to be deposited on the template to form a green shell; and
sintering the green shell to form the investment mold;
removing the template; and
casting the desired article in the investment mold.

28. The method of claim 27, wherein the template comprises a conductive material.

29. The method of claim 27, wherein the template comprises a conductive coating.

30. The method of claim 29, wherein the conductive coating is a sputtered coating.

31. The method of claim 27, wherein the slurry is nonaqueous.

32. The method of claim 31, wherein the slurry has a dielectric breakdown voltage greater than about 50 VDC.

33. The method of claim 31, wherein the slurry comprises a material selected from the group consisting of butanol, methanol, ethanol, and propanol.

34. The method of claim 27, wherein the colloidal particles comprise a material selected from the group consisting of silica, glass, alumina, silicon nitride, silicon carbide, yttria, zirconia, and oxides and nitrides of aluminum and titanium.

35. The method of claim 27, wherein the colloidal particles have an average particle size of less than 75 μm.

36. The method of claim 27, wherein the colloidal particles have an average particle size of less than 40 μm.

37. The method of claim 27, wherein the colloidal particles have an average particle size of less than 10 μm.

38. The method of claim 27, wherein the colloidal particles have an average particle size of less than 1 μm.

39. The method of claim 27, wherein the colloidal particles have an average particle size of less than 100 nm.

40. The method of claim 27, wherein the colloidal particles have an average particle size of less than 10 nm.

41. The method of claim 27, wherein the salt is selected from the group consisting of sodium chloride, potassium chloride, rubidium chloride, cesium chloride, zinc chloride, and potassium carbonate.

42. The method of claim 27, wherein the salt is a metal salt.

43. The method of claim 42, wherein the metal salt is a halide or a carbonate.

44. The method of claim 27, wherein the salt is an alkyl halide.

45. The method of claim 27, wherein the salt is present in a concentration of 5% by weight or less.

46. The method of claim 27, wherein the salt is present at a concentration in the slurry that is at or below its solubility limit.

47. The method of claim 27, wherein the applied voltage is about 100 volts.

48. The method of claim 47, wherein the applied voltage produces a current of about 3-5 mA.

49. The method of claim 27, wherein the green shell has a pore fraction not greater than 40% by volume.

50. The method of claim 27, wherein the green shell has a pore fraction not greater than 30% by volume.

51. The method of claim 27, further comprising drying the green shell prior to sintering.

52. The method of claim 27, further comprising:

after immersing the template and applying a voltage, immersing the template in a second slurry comprising a second plurality of colloidal particles; and

applying a second voltage to the template to cause the second plurality of colloidal particles to be deposited on the green shell to increase its thickness.

53. A method of producing a desired article by investment casting, comprising:

providing a master template having a predetermined shape;

using the master template to produce a transfer mold having a shape complementary to the master template, wherein the transfer mold comprises a flexible material;

molding a sacrificial template in the transfer mold, the sacrificial template comprising a material that can be melted, burned, or leached;

depositing an investment mold on the sacrificial template, wherein depositing comprises:

immersing the template in a slurry, the slurry comprising a plurality of colloidal particles and a sufficient quantity of salt to impart an effective charge to the colloidal particles;

applying a voltage to the template, thereby causing the charged colloidal particles to be deposited on the template to form a green shell; and

sintering the green shell to form the investment mold;

removing the sacrificial template by melting, burning, or leaching, without damaging the investment mold; and

casting the desired article in the investment mold.

54. A casting mold, comprising:

a hollow shell comprising a plurality of partially or fully sintered particles and a measurable quantity of salt residue.

55. The casting mold of claim 54, wherein the particles comprise a ceramic material.

56. The casting mold of claim 54, wherein the partially or fully sintered particles have an average particle size of less than about 75 μm.

57. The casting mold of claim 54, wherein the partially or fully sintered particles have an average particle size of less than about 40 μm.

58. The casting mold of claim 54, wherein the partially or fully sintered particles have an average particle size of less than about 10 μm.

59. The casting mold of claim 54, wherein the partially or fully sintered particles have an average particle size of less than about 1 μm.

60. The casting mold of claim 54, wherein the partially or fully sintered particles have an average particle size of less than about 100 nm.

61. The casting mold of claim 54, wherein the partially or fully sintered particles have an average particle size of less than about 10 nm.

62. The casting mold of claim 54, wherein the salt residue is selected from the group consisting of sodium chloride, potassium chloride, rubidium chloride, cesium chloride, zinc chloride, and potassium carbonate.

63. A casting mold, produced by:
immersing at least a first portion of a template in a first slurry, the first slurry comprising
a plurality of colloidal particles; and
a sufficient quantity of salt to impart an effective charge to the colloidal particles;
applying a voltage to the template, thereby causing the charged colloidal particles to be deposited on the template to form a green shell about at least the first portion of the template; and
sintering the green shell to form the casting mold having greater mechanical integrity than the green shell.

64. The casting mold of claim 63, wherein the colloidal particles comprise a material selected from the group consisting of silica, glass, alumina, silicon nitride, silicon carbide, yttria, zirconia, and oxides and nitrides of aluminum and titanium.

65. The casting mold of claim 63, wherein the colloidal particles have an average particle size of less than about 75 μm.

66. The casting mold of claim 63, wherein the colloidal particles have an average particle size of less than about 40 μm.

67. The casting mold of claim 63, wherein the colloidal particles have an average particle size of less than about 10 μm.

68. The casting mold of claim 63, wherein the colloidal particles have an average particle size of less than about 1 μm.

69. The casting mold of claim 63, wherein the colloidal particles have an average particle size of less than about 100 nm.

70. The casting mold of claim 63, wherein the colloidal particles have an average particle size of less than about 10 nm.

71. The casting mold of claim 63, wherein the salt is selected from the group consisting of sodium chloride, potassium chloride, rubidium chloride, cesium chloride, zinc chloride, and potassium carbonate.

72. The casting mold of claim 63, wherein the salt is a metal salt.

73. The casting mold of claim 72, wherein the salt is a halide or a carbonate.

74. The casting mold of claim 63, wherein the salt is an alkyl halide.

75. The casting mold of claim 63, wherein the green shell has a pore fraction not greater than 40% by volume.

76. The casting mold of claim 63, wherein the green shell has a pore fraction not greater than 30% by volume.

77. The casting mold of claim 63, wherein the green shell comprises a plurality of layers of particles, and wherein adjacent layers of particles differ in size distribution or in composition.

78. The casting mold of claim 63, further produced by, before sintering the green shell:

immersing the template in a second slurry comprising a plurality of colloidal particles; and

allowing the slurry to dry, thereby causing the colloidal particles to be deposited on a second portion of the template and the green shell to form a second green shell.